		Uniwell
	NX-5400 *01 type* *Interfaces and* *Peripherals Manual*	
		Sep.11.2002

CAUTION!

When the control key position is OFF, the display is off and keyboard is disabled but the ECR's power is still **ON**. So that before you open the upper case, make sure that the AC cord is disconnected. Especially when you replace the ROM, it must be disconnected, otherwise the ECR will be damaged.

CONTENTS

I. INTERFACE INFORMATION **1**

II. IRC SYSTEM **3**

III. PERIPHERALS **5**
- **1. TP-420/422/522/722 (Kitchen Printer, connected to ch-A)** **5**
- **2. TP-620 (Slip Printer, connected to ch-A)** **6**
- **3. SCANNER** **7**

IV. PC COMMUNICATION **9**
- **1. BATCH COMMUNICATION** **9**
- **2. PROGRAM LOADER (PLM 2000)** **9**

V. ECR TO ECR RAM DATA TRANSFER **10**

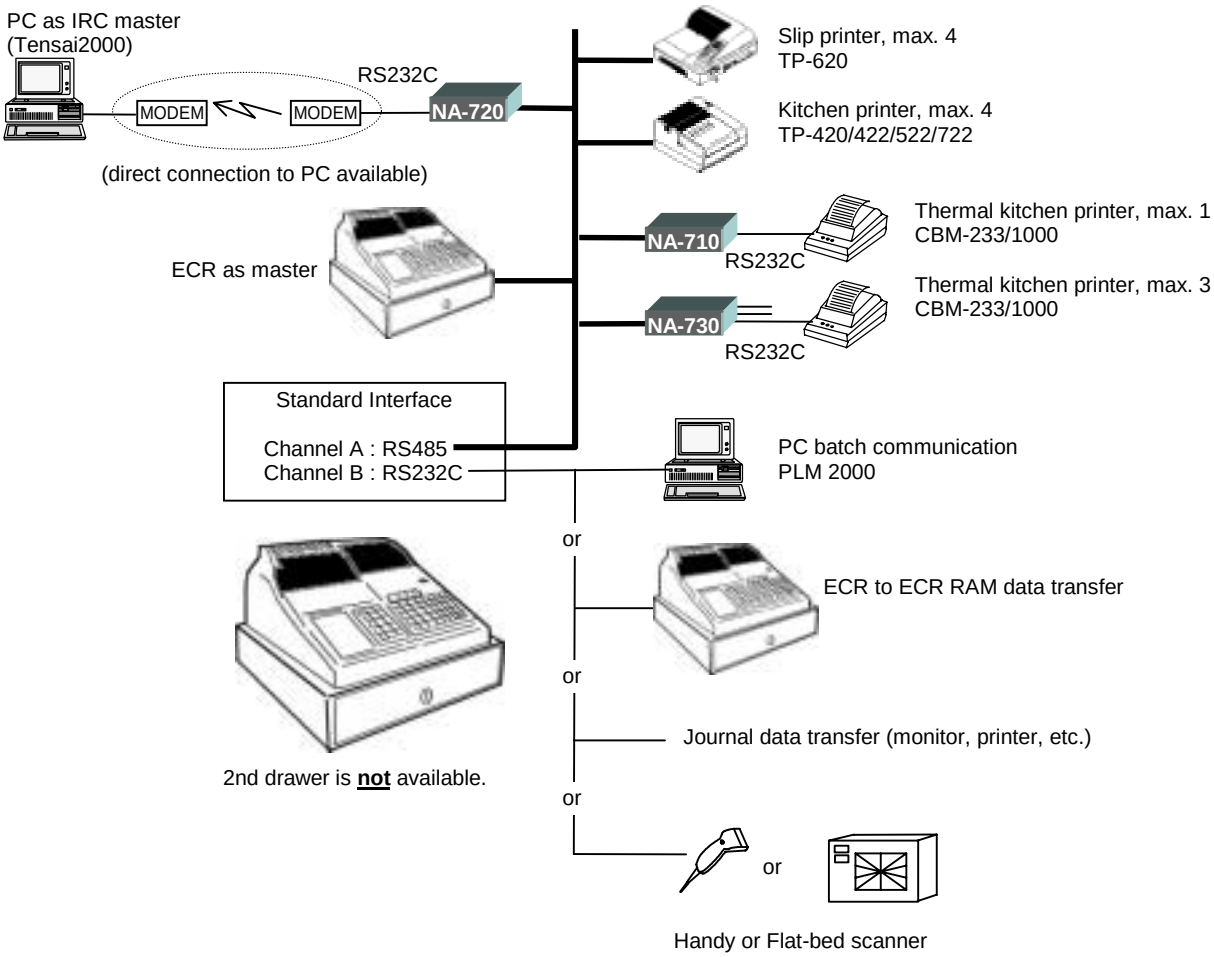
VI. JOURNAL DATA TRANSFER **11**

VII. CABLE CONNECTION **12**
- **1. CHANNEL A --- IRC LINE** **12**
- **2. CHANNEL B** **13**
  1) ECR --- PC 13
  2) ECR --- AUTO ANSWER MODEM (to AUTO DIAL MODEM --- PC) 13
  3) ECR --- HANDY SCANNER 14
  4) ECR --- FLAT BED SCANNER 14
  5) ECR --- ECR FOR RAM DATA TRANSFER 15
  6) ECR --- PERIPHERAL FOR JOURNAL DATA TRANSFER 15

I. INTERFACE INFORMATION

System Configuration

Maximum 32 units can be connected via IRC line including the master, max. 4 kitchen printers and max. 4 slip printers. However, an ECR can use one slip printer.



Pin Assignment & Character Structures

Channel A (RS485) and Channel B (RS232C)

CHANNEL A

(RS485, RJ-45 modular type connector)

Baud rate : 19,200 bps or 38,400 bps [SF-62.a]

Character structure : start bit = 1 bit
data bit = 8 bits
stop bit = 2 bits
parity = even

PIN #	SIGNAL	FUNCTION
1	DATA+	Comm. data signal (+)
2	DATA-	Comm. data signal (-)
3	CTL+	Comm. line control (+)
4		
5		
6	CTL-	Comm. line control (-)
7		
8		

CHANNEL B

(RS232C, 9-pin D-sub female connector)

Block size : 256 or 512 characters for PC batch communication [SF-66.e]

Baud rate : 300 ~ 38,400 bps [SF-66.f~h]
9,600 or 19200 bps [SF-62.d]
for ECR to ECR RAM data transfer

Character structure : start bit = 1 bit
data bit = 7 bits or 8 bits [SF-66.b]
stop bit = 1 bit or 2 bits [SF-66.d]
parity = odd, even or null [SF-66.a,c]

PIN #	I/O	SIGNAL	FUNCTION
1		P.GND	Protection ground
2	OUT	TXD	Transmitted data
3	IN	RXD	Received data
4	OUT	RTS	Request to send
5	IN	CTS	Clear to send
6	OUT	+5V	not used
7		GND	Signal ground
8	IN	DCD	Data carrier detect
9	OUT	DTR	Data terminal ready

II. IRC SYSTEM

The master PC or ECR can transmit programming data to the slave ECRs and collect the sales data from the slave ECRs via channel A.

- PC as Master using PC-IRC communication module Tensai2000
- ECR as Master : Any ECR can be a master ECR.

Preparation

Before using the IRC system, the following presetting must be performed;

a) For new machines being added to the system, perform RAM test SP-9901 to erase all RAM contents. **Do not perform this operation on the machines already used as it will erase all preset data.**

b) Confirm the following three points on each ECR;

1. Each ECR is connected by the IRC line. Refer to VII. Cable Connection (page 12).

2. Confirm the machine number. (PGM-171)
   The last two digits of the machine number used for ECR ID #, must be **31 out of '1 ~ 62'** and different for each ECR.

3. Confirm the baud rate is the same as the master by system function flag [SF-62.a]. (PGM-100)

SF-62	1/0	bit	1	0
		a	Baud rate: IRC line (ch-A) is 38400 bps	19200 bps

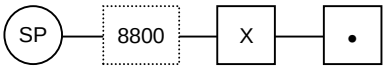
c) IRC status check operation

In the case of a PC as master ;

Tensai2000: Status check is not required on Tensai2000. Perform it on ECR as follows.

In the case of an ECR as master ;

Any ECR where this operation is performed becomes the master ECR.



During this operation, the following message is displayed;

Master

```
##P-8800
```

##: ECR sequential # (01~62)

Slave

```
-irc comm-nn
```

nn: block #

The master ECR will check ECR sequential number up to 62, even when there are fewer ECRs than 31 ECRs on the IRC line.

After IRC status check is completed, all ECR's connected can communicate via IRC line, and the IRC system configuration table is printed as follows:

```
S-8800
01 #104 OK
02 #105 OK
03 #106 OK
#104-0006          19:07P
```

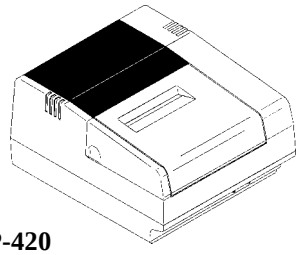
ECR sequential #, machine #, IRC status

If there is a communication error, 'NG' will be printed instead of 'OK'. Retry SP-8800 operation.

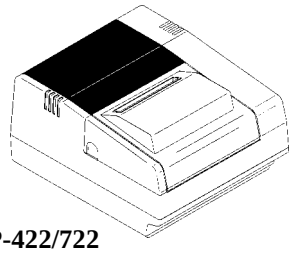
For the "Program data transfer from master to slaves", "IRC report" and "IRC error", please refer to programming manual.

III. PERIPHERALS

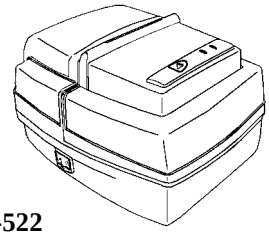
1. TP-420/422/522/722 (Kitchen Printer, connected to ch-A)



TP-420



TP-422/722



TP-522

ECR SETTINGS

a) Program the following:

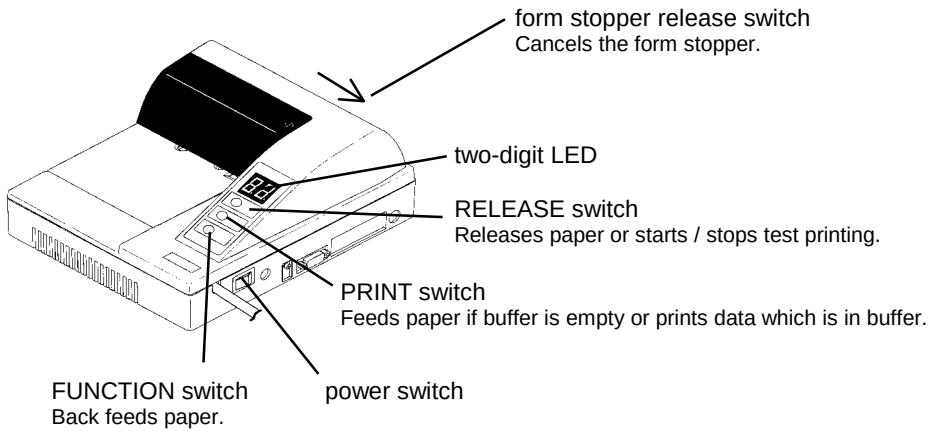
[SF-64.e~h]	kitchen printer to be used
[SF-65]	back-up kitchen printer
[SF-62.a]	baud rate for IRC line **[1]** 38400 bps, **[0]** 19200 bps The character structure for IRC line has already been fixed on ECR. (1 start bit, 8 data bits, 2 stop bits, even parity)
[PF-4.e~h]	PLU data to be transmitted to which kitchen printer

b) Program the ECR name and the kitchen printer name by the character programming (PGM-152). These names are printed on the kitchen printer every time, like "ECR name --> KP name".

TERMINAL PRINTER SETTINGS

Refer to the respective TERMINAL PRINTER USER'S MANUAL.

2. TP-620 (Slip Printer, connected to ch-A)


form stopper release switch
Cancels the form stopper.
two-digit LED
RELEASE switch
Releases paper or starts / stops test printing.
PRINT switch
Feeds paper if buffer is empty or prints data which is in buffer.
FUNCTION switch
Back feeds paper.
power switch

ECR SETTINGS

a) Select following;

[SF-57.h]	**[1]** with slip printer
[SF-62.a]	baud rate for IRC line: **[1]** 38400 bps, **[0]** 19200 bps The character structure for IRC line has already been fixed on ECR. (1 start bit, 8 data bits, 2 stop bits, even parity)
(PGM-179)	Slip printer ID # (should match DIP SW 2 setting of TP-620)

b) See [SF-57 ~ 60] for other selections;
slip logo, slip print compulsory condition, automatic slip print, maximum item lines on slip, pre-feed lines on slip, etc.

TP-620 SETTINGS

Refer to the separate document "TERMINAL PRINTER TP-620 USER'S MANUAL".

3. SCANNER

The handy scanner models HC66R (BHS-6060/R) and BCH5442-STA which are supplied by Uniwell can be used immediately after the scanner cable is connected to channel B.

If they are supplied from third party or a scanner of other manufacturers, some settings are required. Refer to the next page.

HC66R and BCH5442-STA's factory settings: 9600 bps, 7-bit data, even parity, 1 stop bit

ECR SETTINGS

SF-62	1/0	bit	1	0
		b	With scanner	without scanner
		c	Expanded UPC-E code	normal UPC-E code
		d	**Source Marking Code** : 8, 13-digit PLU codes including check digit are programmed (ECR treats the last one digit as check digit.)	does not include check digit (7, 12-digit PLU code are programmed)
			In-Store Marking Code (for non-embedded code **[SF-76,78.e,f=00]**) : 10-digit article code with check digit is programmed as PLU code (also see [SF-76,78.d])	10-digit article code only (also see [SF-76,78.d])

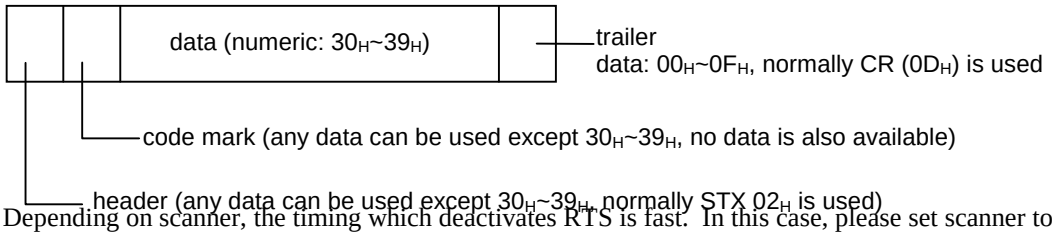
SF-66				
		a	Character structure: Odd parity	Even parity
		b	Character structure: 8-bit data	7-bit data
		c	Character structure: Parity permitted	prohibited
		d	Character structure: 2 stop bits	1 stop bit
		e	Block size is 512 characters	256 characters
		f	Baud Rate [f,g,h]	
		g	[000] 38400 bps; [001] 19200 bps; [010] 9600 bps; [011] 4800 bps;	
		h	[100] 2400 bps; [101] 1200 bps; [110] 600 bps; [111] 300 bps	

SCANNER SETTING

Set the followings by a preset bar code menu or a dip switch of the scanner;

- Communication condition (baud rate, data length, stop bit, parity) to match ECR's setting.
- **RTS/CTS handshake (fixed)**
- **Message RTS/CTS (fixed)** --- not character RTS/CTS

[INFORMATION] If the scanner's data format is as below it can be used.


data (numeric: 30_H~39_H)
trailer
data: 00_H~$0F_H$, normally CR ($0D_H$) is used
code mark (any data can be used except 30_H~39_H, no data is also available)
header (any data can be used except 30_H~39_H, normally STX 02_H is used)

Note: Depending on scanner, the timing which deactivates RTS is fast. In this case, please set scanner to send 2-byte trailer data (post-amble). For example, CR & LF.

Settings for scanner from third party

When you are using BHS-6060 and BCH-5442-STA supplied from third party or a scanner of other manufacturers, some settings are required. Perform the following steps:

1. Connect the scanner to the correct ECR's interface port. RTS signal need to be wired.

2. Set the system function flags of ECR.

3. Set the followings on the scanner by a preset bar code menu or a dip switch of the scanner.
   a. **Message (not text) RTS/CTS handshake** must be set. Some scanner has this fixed.
   b. If there is a selection either "scanner ready" or "data ready", choose "**data ready**".
   c. "Baud rate, data length, stop bit, parity" should be matched to the ECR's settings.
   d. Set the data transmission format of the scanner. Refer to the previous page.

4. Check the scanner works with ECR.

5. If the scanner does not work, the timing of the scanner which deactivates RTS may be fast.
   In order to delay the deactivating timing, increase the trailer (post-amble, terminator) to 2 byte data from 1 byte data. Set "**CR, LF**" for example. Then the scanner will work with ECR.

IV. PC COMMUNICATION

The following functions can be done with a PC through one of channel B.

1. BATCH COMMUNICATION

Set terminal address (PGM-172) to communicate with ECR. Refer to the programming manual for the sequence. For details about PC batch communication, refer to PROTOCOL MANUAL UCP-101 and a separate appendix.

REMOTE MEMORY CHANGE

By remote memory change, the PC can modify the memory contents of the ECR. This function consists of the following three types;

a) Memory Change
Alters the ECR's memory contents, by designating the memory address.

b) Memory Management
Alters the contents of the PLU, group and cashier memories.

c) Date/Time Change
Sets the date and time from the PC.

REMOTE MEMORY DUMP

By remote memory dump, the PC can read the memory contents of the ECR.

a) X/Z Report Dump
The X/Z report dump is similar to the X/Z report of the ECR. Using this function, the PC can collect or reset an individual ECR's data.

b) Complete Memory Dump
Collects the ECR's complete memory data from the PC. This is used mainly for making a back-up file of the ECR memory on the PC.

2. PROGRAM LOADER (PLM 2000)

Using the software PLM 2000, the ECR's data can be uploaded/edited on the PC and restored to the ECR. Please follow the steps on the PLM 2000 to setup.

V. ECR TO ECR RAM DATA TRANSFER

ECR to ECR RAM data transfer is done by using channel B.

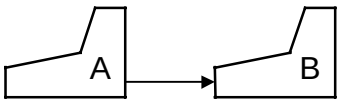
This transfer will send the programming data and sales data. If only the programming data is required, reset the sales data by issuing all Z-reports, then follow the sequence below.

PREPARATION

1) Set the system function flags [SF-62.e, SF-66.a~d] (communication condition settings for ch-B) for both ECRs.

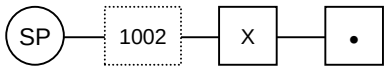
2) Connect the ECR to another ECR using channel B.
Refer to page 15 for the cable connection.

RAM DATA TRANSFER

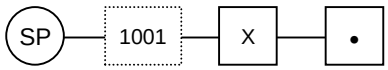


From ECR A to ECR B

1) **On ECR B**, perform the sequence below. Check that "-- Pc-in --" is displayed.



2) **On ECR A**, perform the sequence below. "-- Pc-out --" is displayed during the communication.



VI. JOURNAL DATA TRANSFER

The journal data is transmitted to a peripheral device through channel B. For the cable connection, refer to the next section.

PREPARATION

Set the following flags on ECR and the peripheral device to match ECR's communication condition below:

	1/0	bit	1	0
SF-62		h	Journal data transmitted through channel B	not transmitted

SF-66		a	Character structure: Odd parity	Even parity
		b	Character structure: 8-bit data	7-bit data
		c	Character structure: Parity permitted	prohibited
		d	Character structure: 2 stop bits	1 stop bit
		e		
		f	Baud Rate [f,g,h]:	
		g	[000] 38400 bps; [001] 19200 bps; [010] 9600 bps; [011] 4800 bps;	
		h	[100] 2400 bps; [101] 1200 bps; [110] 600 bps; [111] 300 bps	

DATA FORMAT

journal data (24 digits)	CR	LF

TRANSMITTED CHARACTER

CODE	0	1	2	3	4	5	6	7	8	9
0			Space	0	@	P	Space	p	TD	FS
1			T1	1	A	Q	a	q	PO	F1
2			T2	2	B	R	b	r	RA	F2
3			#	3	C	S	c	s	R2	F3
4			$	4	D	T	d	t	DP	F4
5			%	5	E	U	e	u	TB	F5
6			&	6	F	V	f	v	RC	F6
7			'	7	G	W	g	w	OI	F7
8			£	8	H	X	h	x	□	ä
9			Ñ	9	I	Y	i	y	◊	§
A	LF		*	:	J	Z	j	z	DL	β
B			⊤	ϕ	K	Ä	k	T3	=	⊓
C			Å	<	L	Ö	l	T4	₧	⊔
D	CR		-	Σ	M	Ü	m	FC	T5	_
E			.	>	N	Æ	n	→	T6	(
F			/	?	O	Φ	o	DW	T7	)

Double-width characters (7F) are converted to one character code and one space code.

VII. CABLE CONNECTION

1. CHANNEL A --- IRC LINE

RJ-45 Modular Type Cable Information
Please use the straight LAN cable (shielded type) which is generally sold.

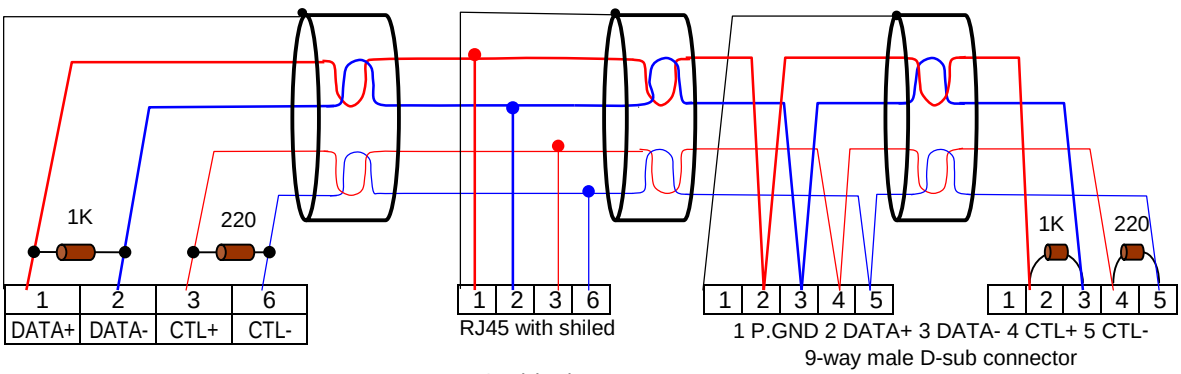
RS422/485 Shielded Twisted Pair	
Conductor:	AGW24
Characteristic impedance:	< 100 ohms
Capacitance per meter:	40 - 100 pF
Attenuation at 1Mhz / 100m:	2 - 6 db
Cable length:	max. 1200 m
Connectors and Connector Shells:	Ideally use: EMI / RFI Shielding RJ45 type

About Ground
Each ECR must be grounded at the same level and the termination resistors must be fitted on the first and last devices on the line. Please refer to the document "IRC & TERMINAL PRINTER CABLING INSTRUCTION (RS-485)" for how to connect cables.

Joint Box
JOINT BOX 485 (REF.# 62092) makes the cable connection simple, quick, and easy between Uniwell ECRs and Terminal Printers on an IRC line (RS-485). Refer to the option instruction manual for details and connection samples.

Ferrite Core when TP-722 is connected:
A ferrite core must be also purchased from third party and fasten beside the IRC cable connector of ECR and TP-722 (9-pin D-sub or modular) to prevent radio interference. Any type of ferrite core can be used.

Recommended ferrite core size
Approx. Height 21 mm x Length 21 mm (Inside Diameter: 6.5 mm)
For the inside diameter, please measure the cable used by yourself.



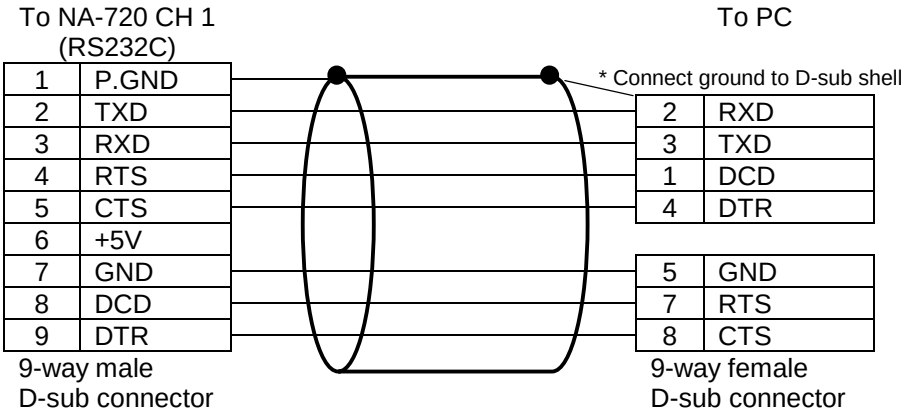
ECR channel A
RJ45 modular type connector with shield

1K ohm termination resistor (1Kohm)
220 ohms termination resistor (220ohms)

To ECR (ch-A)
To kitchen/receipt printer TP-722 (RJ45)

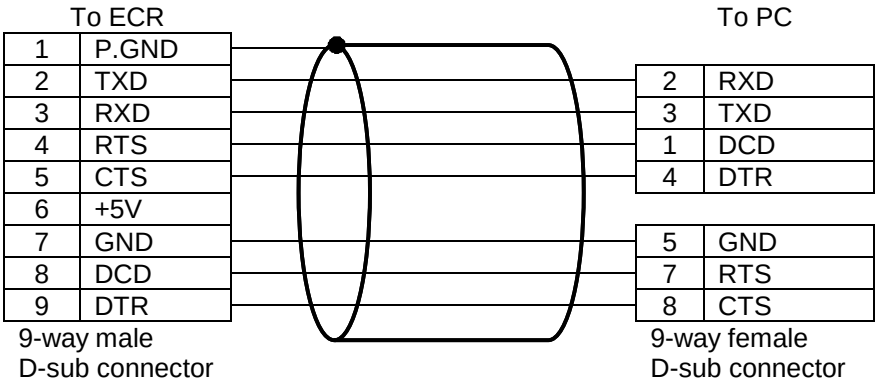
To slip printer TP-620
To kitchen/receipt printer TP-420/422/522 TP-722 (D-sub)
To Network Adapter NA-720 (MASTER)
To Network Adapter NA-710/730 for kitchen printer CBM-233/1000

Cable connection between NA-720 (CH1) and PC

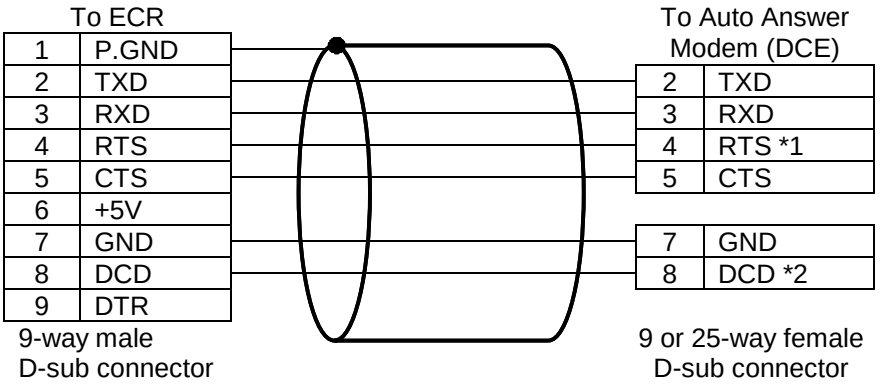


2. CHANNEL B

1) ECR --- PC

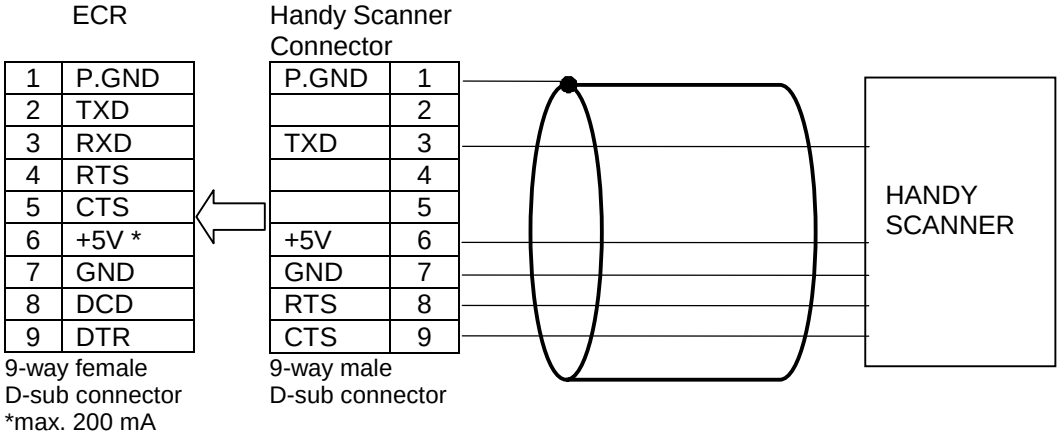


2) ECR --- AUTO ANSWER MODEM (to AUTO DIAL MODEM --- PC)

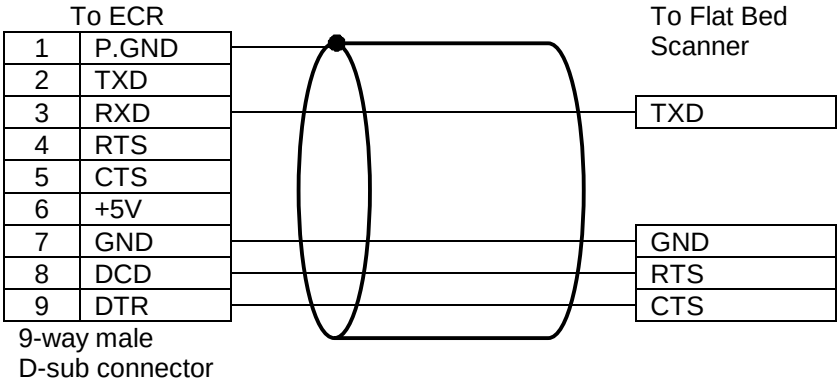


*1 Do not connect when ECU (Error Correction Unit) is fitted.
*2 May be omitted when using duplex (LINNET) Modem.

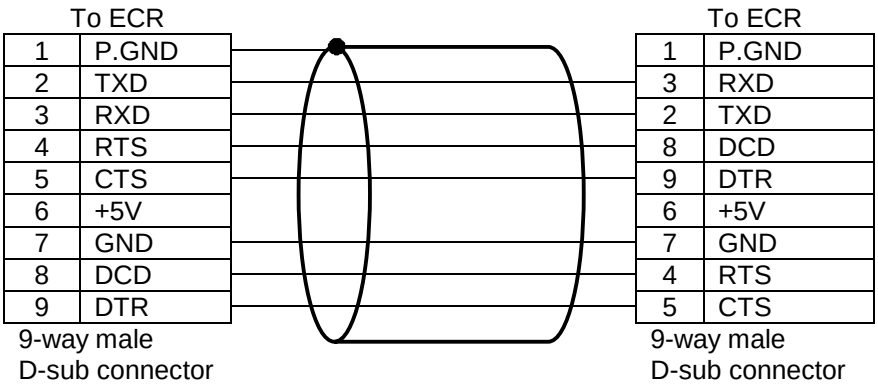
3) ECR --- HANDY SCANNER



4) ECR --- FLAT BED SCANNER



5) ECR --- ECR FOR RAM DATA TRANSFER



6) ECR --- PERIPHERAL FOR JOURNAL DATA TRANSFER